

10584378SEQ
SEQUENCE LISTING

<110> Sanofi Pasteur
<120> Modified KSA and Uses Thereof
<130> API-03-17-PCT-US
<140> 10/584,378
<141> 2006-06-22
<150> PCT/US04/42980
<151> 2004-12-23
<150> 60/532,205
<151> 2003-12-23
<160> 22
<170> PatentIn version 3.3
<210> 1
<211> 16
<212> PRT
<213> Homo sapiens
<400> 1

Ser Arg Arg His His Cys Arg Ser Lys Ala Lys Arg Ser Arg His His
1 5 10 15

<210> 2
<211> 8210
<212> DNA
<213> ALVAC

<400> 2
gcccccttcgt ctcgcgcggt tcggtgatga cggtgaaaac ctctgacaca tgcagctccc 60
ggagacggtc acagcttgtc tgtaagcgga tgccgggagc agacaagccc gtcagggcgc 120
gtcagcgggt gttggcgggt gtcggggctg gcttaactat gcggcatcag agcagattgt 180
actgagagtg caccatatgc ggtgtgaaat accgcacaga tgcgtaagga gaaaataccg 240
catcaggcgc cattcgccat tcaggctgcg caactgttgg gaagggcgat cgggtcgggc 300
ctcttcgcta ttacgccagc tggcgaaagg gggatgtgct gcaaggcgat taagttgggt 360
aacgccaggg ttttcccagt cagcagcttg taaaacgacg gccagtgcca agcttggtg 420
caggtattct aaactaggaa tagatgaaat tatgtgcaaa ggagatacct ttagatatgg 480
atctgattta tttggttttt cataatcata atctaacaac attttacta tactatacct 540
tcttgacaaa gtcgccatta gtagtataga cttatacttt gtaaccatag tatacttttag 600
cgcgtcatct tcttcatcta aaacagattt acaacaataa tcatcgtcgt catcttcatc 660
ttcattaaag ttttcatatt caataacttt cttttctaaa acatcatctg aatcaataaa 720
catagaacgg tatagagcgt taatctccat tgtaaaatat actaacgcgt tgctcatgat 780

10584378SEQ

gtactttttt	tcattattta	gaaattatgc	atcttagatc	tttataagcg	gccgtgatta	840
actagtcata	aaaacccggg	atcgattcta	gactcgagat	aaaaactata	tcagagcaac	900
cccaaccagc	actccaatca	tgatgccgac	agtggcccca	gctgagagac	caggagaagt	960
tccagatgca	gagactgtga	tgctcttgac	tatggaatta	ttgcggccag	tagccaagtt	1020
agagacaaaa	caggcatagg	ttccgttatt	atctggcgtg	atcttggcga	taaagagaac	1080
ttgtgtgtgt	tgctgcggta	ttccattgat	acgccaagaa	tactgcgggg	atgggttaga	1140
ggccgagtg	caggagaggt	tgaggtccgc	ttccgaaagg	taagacgagt	ctggggggga	1200
aatgatgggg	gtgtccggcc	catagaggac	atccagggtg	actgggtcac	tgcggtttgc	1260
actcactgag	ttctggattc	cacatacata	ggctcttgcg	tcatttcttg	tgacattgaa	1320
tagagtgagg	gtctgttg	cattggacag	ctgcagcctg	ggactgactg	ggaggctctg	1380
accatttacc	caccacaggt	aggttgtgtt	ctgagcctca	ggttcacagg	tgaaggccac	1440
agcatccttg	tcctccacgg	gtttggagtt	gttgctggag	atggagggct	tgggcagctc	1500
cgcggaacaa	gttattgttt	taactgtagt	cctgctgtga	ccactggctg	agttattggc	1560
ctggcaagta	tagagtccgc	tgttcttctc	agttatgttg	cttataaata	actcttgagt	1620
atgctgctga	atgtttccat	caatcagcca	ggagtactgt	gcaggggggt	tggatgctgc	1680
atggcaagaa	aggctcaagt	tcacgccggg	acggtagtag	gtgtatgatg	gagatatagt	1740
tgggtcgtct	gggccataca	aaacattaag	gataacaggg	tcggagtgat	caacggataa	1800
ttcattctga	atgccacact	cataaggctc	tacatcattg	cgagtaacgg	acaggagtgt	1860
caatgtgcgg	ttatcattag	acaactgcaa	gcgtgggcta	accggcaaac	tttggttatt	1920
gaccacccat	aaataagtgg	tattttgaat	ctctggctca	caagttaatg	caactgcgtc	1980
ctcatcctca	actgggtag	aattgttact	agttatgaat	ggttttggtg	gctcatcac	2040
ggtaatcgtc	gtcacggttg	tgcggttgag	tccggtgtcg	ctattgtgag	cttggcacgt	2100
gtaggatcca	ctattgttca	cggtaatatt	gggaatgaac	agttcctggg	tggactgttg	2160
gaaagtgcc	ttgacaaacc	agctgtattg	ggcgggagga	ttgctagcgg	catgacagct	2220
cagattcaga	tttcccctg	atctatagct	tgtgtttaga	gggctgattg	taggagcatc	2280
gggtccgtaa	agcacgttga	gaatcactga	atcagacctc	ctggcgctga	ctggattttg	2340
ggtttcgcat	ttgtagcttg	ctgtgtcggt	cctgggtcacg	ttaaacaggg	tcagagttct	2400
atctccgttg	ctgagttgga	gtctagggga	cacaggcagg	gactgggtgt	tcaccacca	2460
gagatatgtt	gcgtcttgag	tttcgggctc	gcatgtaaaa	gcgacggcat	ctttgtcttc	2520
gacaggctta	ctattattgg	agctaataga	aggcttaggg	agttccgggt	ataccggaa	2580
ctggccagtt	gcttcttcat	tcacaagatc	tgactttatg	acgtgtaggg	tgtagaatcc	2640

10584378SEQ

tgtgtcattc	tgatgatgt	tctggatcag	cagggatgca	ttgggggtata	ttatctctcg	2700
accactgtat	gcgggccctg	gggtagcttg	ttgagttcct	attacatatc	ctataatttg	2760
acggttgcc	tccactcttt	cacctttgta	ccagctgtag	ccaaaaagat	gctggggcag	2820
attgtggaca	agtagaagca	cctccttccc	ctctgcgaca	ttgaacggcg	tggattcaat	2880
agtgagcttg	gcagtggtgg	gcgggttcca	gaagggttaga	agtgaggctg	tgagcaggag	2940
cctctgccag	gggatgcacc	atctgtgggg	aggggccgag	ggagactcca	ttatttatat	3000
tccaaaaaaa	aaaaataaaa	tttcaatttt	tgtcgacctg	cagctcgacg	gatccccccg	3060
ggttctttat	tctatactta	aaaagtga	ataaatacaa	aggttcttga	gggttgtgtt	3120
aaattgaaag	cgagaaataa	tcataaatta	tttcattatc	gcgatatccg	ttaagtttgt	3180
atcgtaatgg	aggagccgca	gtcagatcct	agcgtcgagc	cccctctgag	tcaggaaaca	3240
ttttcagacc	tatggaaact	acttcctgaa	aacaacgttc	tgtccccctt	gccgtcccaa	3300
gcaatggatg	atgtgatgct	gtccccggac	gatattgaac	aatggttcac	tgaagaccca	3360
gggtccagatg	aagctcccag	aatgccagag	gctgtctccc	ccgtggcccc	tgaccagca	3420
gctcctacac	cggcggcccc	tgaccagcc	ccctcctggc	ccctgtcatc	ttctgtccct	3480
tcccagaaaa	cctaccaggg	cagctacggt	ttccgtctgg	gcttcttgca	ttctgggaca	3540
gccaagtctg	tgacttgcac	gtactcccct	gccctcaaca	agatgttttg	ccaactggcc	3600
aagacctgcc	ctgtgcagct	gtgggttgat	tccacacccc	cggccggcac	ccgcgtccgc	3660
gccatggcca	tctacaagca	gtcacagcac	atgacggagg	ttgtgaggcg	ctgccccac	3720
catgagcgct	gctcagatag	cgatgggtctg	gcccctcctc	agcatcttat	ccgagtggaa	3780
ggaaatttgc	gtgtggagta	tttggatgac	agaaacactt	ttcgacatag	tgtggtggtg	3840
ccctatgagc	cgctgaggt	tggctctgac	tgtaccacca	tccactacaa	ctacatgtgt	3900
aacagttcct	gcatgggcgg	catgaaccgg	aggcccatcc	tcaccatcat	cacactggaa	3960
gactccagtg	gtaatctact	gggacggaac	agctttgagg	tgctgttttg	tgctgtcct	4020
gggagagacc	ggcgcacaga	ggaagagaat	ctccgcaaga	aaggggagcc	tcaccacgag	4080
ctgccccag	ggagcactaa	gcgagcactg	cccaacaaca	ccagctcctc	tccccagcca	4140
aagaagaaac	cactggatgg	agaatatttc	acccttcaga	tccgtgggcg	tgagcgcttc	4200
gagatgttcc	gagagctgaa	tgaggccttg	gaactcaagg	atgccaggc	tgggaaggag	4260
ccagggggga	gcagggtca	ctccagccac	ctgaagtcca	aaaagggtca	gtctacctcc	4320
cgccataaaa	aactcatgtt	caagacagaa	gggctgact	cagactgaac	gcgtttttta	4380
tcccgggctc	gagggtaccg	gacccctttt	atagctaatt	agtcacgtac	ctttgagagt	4440
accacttcag	ctacctcttt	tgtgtctcag	agtaactttc	tttaataaat	tccaaaacag	4500
tatatgattt	tccatttctt	tcaaagatgt	agttttacatc	tgctcctttg	ttgaaaagta	4560

10584378SEQ

gcctgagcac	ttcttttcta	ccatgaatta	cagctggcaa	gatcaatfff	tcccagttct	4620
ggacatttta	ttttttttaa	gtagtgtgct	acatatttca	atatttccag	attgtacagc	4680
gatcattaaa	ggagtacgtc	ccatgtttatc	cagcaagtca	gtatcagcac	ctttgttcaa	4740
tagaagttta	accattgtta	aatfffftatt	tgatacggct	atatgtagag	gagttaaccg	4800
atccgtgttt	gaaatatcta	catccgccga	atgagccaat	agaagtttaa	ccaaattaac	4860
tttgtaagg	taagctgcca	aacacaaagg	agtaaagcct	ccgctgtaaa	gaacattgtt	4920
tacatagtta	ttcttcaaca	gatctttcac	tattttgtag	tcgtctctca	acaccgcatc	4980
atgcagacaa	gaagtgtgtc	attcagtaac	tacaggttta	gctccatacc	tcataagat	5040
ttttatagcc	tcggtattct	tgaacattac	agccatttca	agaggagatt	gtagagtacc	5100
atattccgtg	ttagggtcga	atccattgtc	caaaaacctt	tttagagatg	cattgtcatt	5160
atccatgata	gcctcacaga	cgtatatgta	agccatcttg	aatgtataat	ttgtttgttt	5220
tcaacaaccg	ctcgtgaaca	gcttctatac	tttttcattt	tcttcatgat	taatatagtt	5280
tacggaatat	aagtatacaa	aaagtttata	gtaatctcat	aatatctgaa	acacatacat	5340
aaaacatgga	agaattacac	gatgtcgttg	agataaatgg	ctttttattg	tcatagttta	5400
caaattcgca	gtaatcttca	tctttttacga	atattgcaga	atctgtttta	tccaaccagt	5460
gattttttgta	taatataact	ggatatcctat	cttccgatag	aatgctgtta	tttaacattt	5520
ttgcacctat	taagttacat	ctgtcaaadc	catctttcca	actgacttta	tgtaacgatg	5580
cgaaatagca	tttatcacta	tgctgtaccc	aattatcatg	acaagattct	cttaaatacg	5640
taatcttatt	atctcttgca	tattcgtaat	agtaattgta	aagagtatac	gataacagta	5700
tagatataca	cgtgatataa	atattttaacc	ccattcctga	gtaaaataat	tacgatatta	5760
catttccttt	tattattttt	atgttttagt	tatttgtag	gttatacaaa	aattatgttt	5820
atttggtgat	atttaaagcg	tcgttaagaa	taagcttagt	taacatatta	tcgcttaggt	5880
tttgtagtat	ttgaatcctt	tctttaaatg	gattattttt	ccaatgcata	tttatagctt	5940
catccaaagt	ataacattta	acattcagaa	ttgcgggccgc	aattcaattc	gtaatcatgg	6000
tcatagctgt	ttcctgtgtg	aaattgttat	ccgctcacia	ttccacacia	catacgagcc	6060
ggaagcataa	agtgtaaagc	ctgggggtgcc	taatgagtga	gctaactcac	attaattgcy	6120
ttgcgctcac	tgcccgtttt	ccagtcggga	aacctgtcgt	gccagctgca	ttaatgaatc	6180
ggccaacgcy	cggggagagg	cggtttgcgt	attgggcgct	cttccgcttc	ctcgctcact	6240
gactcgctgc	gctcggtcgt	tcggctgcgg	cgagcgggat	cagctcactc	aaaggcggta	6300
atacggttat	ccacagaatc	aggggataac	gcaggaaaga	acatgtgagc	aaaaggccag	6360
caaaaggcca	ggaaccgtaa	aaaggccgcy	ttgctggcgt	ttttccatag	gctccgcccc	6420

10584378SEQ

cctgacgagc atcacaaaaa tcgacgctca agtcagaggt ggcgaaaccc gacaggacta	6480
taaagatacc aggcgtttcc ccctggaagc tccctcgtgc gctctcctgt tccgaccctg	6540
ccgcttaccg gatacctgtc cgcttttctc ccttcgggaa gcgtggcgct ttctcatagc	6600
tcacgctgta ggtatctcag ttcgggtgtag gtcgttcgct ccaagctggg ctgtgtgcac	6660
gaaccccccg ttcagcccga ccgctgcgcc ttatccggta actatcgtct tgagtccaac	6720
ccggtaagac acgacttatc gccactggca gcagccactg gtaacaggat tagcagagcg	6780
aggatatgtag gcggtgctac agagttcttg aagtggtagc ctaactacgg ctacactaga	6840
aggacagtat ttggtatctg cgctctgctg aagccagtta ccttcggaaa aagagttggt	6900
agctcttgat ccggcaaaca aaccaccgct ggtagcggtg gtttttttgt ttgcaagcag	6960
cagattacgc gcagaaaaaa aggatctcaa gaagatcctt tgatcttttc tacggggtct	7020
gacgctcagt ggaacgaaaa ctcacgttaa gggattttgg tcatgagatt atcaaaaagg	7080
atcttcacct agatcctttt aaattaaaaa tgaagtttta aatcaatcta aagtatatat	7140
gagtaaactt ggtctgacag ttaccaatgc ttaatcagtg aggcacctat ctacgcgatc	7200
tgtctatttc gttcatccat agttgcctga ctccccgtcg tgtagataac tacgatacgg	7260
gagggttac catctggccc cagtgtgca atgataccgc gagaccacg ctcaccggct	7320
ccagatttat cagcaataaa ccagccagcc ggaagggccg agcgcagaag tggtcctgca	7380
actttatccg cctccatcca gtctattaat tgttgccggg aagctagagt aagtagttcg	7440
ccagttaata gtttgcgcaa cgttgttgcc attgtctacag gcatcgtggt gtcacgctcg	7500
tcgtttggta tggcttcatt cagctccggt tcccaacgat caaggcgagt tacatgatcc	7560
cccatgttgt gcaaaaaagc ggtagctcc ttcggtcctc cgatcgttgt cagaagtaag	7620
ttggccgcag tgttatcact catggttatg gcagcactgc ataattctct tactgtcatg	7680
ccatccgtaa gatgcttttc tgtgactggt gagtactcaa ccaagtcatt ctgagaatag	7740
tgtatgcggc gaccgagttg ctcttgccc gcgtaatac gggataatac cgcgccacat	7800
agcagaactt taaaagtgtc catcattgga aaacgttctt cggggcgaaa actctcaagg	7860
atcttaccgc tgttgagatc cagttcgatg taaccactc gtgcacccaa ctgatcttca	7920
gcatctttta ctttcaccag cgtttctggg tgagcaaaaa caggaaggca aaatgccgca	7980
aaaaagggaa taagggcgac acggaaatgt tgaatactca tactcttcct ttttcaatat	8040
tattgaagca tttatcaggg ttattgtctc atgagcggat acatatttga atgtatttag	8100
aaaaataaac aaataggggt tccgcgcaca tttcccgaa aagtgccacc tgacgtctaa	8160
gaaaccatta ttatcatgac attaacctat aaaaataggc gtatcacgag	8210

<210> 3
 <211> 8210

10584378SEQ

<212> DNA
<213> ALVAC

<400> 3

cgggaaagca gagcgcgcaa agccactact gccacttttg gagactgtgt acgtcgaggg	60
cctctgccag tgtcgaacag acattcgctt acggccctcg tctgttcggg cagtcccgcg	120
cagtcgcccc caaccgcccc cagccccgac cgaattgata cgccgtagtc tcgtctaaca	180
tgactctcac gtggtatacg ccacacttta tggcgtgtct acgcattcct cttttatggc	240
gtagtccgcg gtaagcggta agtccgacgc gttgacaacc cttcccgcta gccacgcccc	300
gagaagcgat aatgcggtcg accgctttcc ccctacacga cgttccgcta attcaacca	360
ttgcggtccc aaaagggtca gtgctgcaac attttctgc cggtcacggt tcgaaccgac	420
gtccataaga tttgatcctt atctacttta atacacgttt cctctatgga aatctatacc	480
tagactaaat aaacaaaaa gtattagtag tagattgttg taaaagtgat atgatatgga	540
agaacgtgtt cagcggtaat catcatatct gaatatgaaa cattgggtatc atatgaaatc	600
gcgcagtaga agaagtagat tttgtctaaa tgttgttatt agtagcagca gtagaagtag	660
aagtaatttc aaaagtataa gttattgaaa gaaaagattt ttagtagtagac ttagttattt	720
gtatcttgcc atatctcgca attagaggtg acattttata tgattgcgca acgagtacta	780
catgaaaaaa agtaataaat ctttaatacg taaaatctag aaatattcgc cggcactaat	840
tgatcagtat ttttgggccc tagctaagat ctgagctcta tttttgatat agtctcgttg	900
gggttggtcg tgaggttagt actacggctg tcaccggggt cgactctctg gtcctcttca	960
aggtctacgt ctctgacact acgagaactg ataccttaat aacgccgggc atcggttcaa	1020
tctctgtttt gtccgatatc agggcaataa taaaccgcac taaaaccgct atttctcttg	1080
aacacacaca acgacgcat agggtaacta tgcggttctt atgacgcccc tacccaatct	1140
ccggctcacc gtcctctcca actccaggcg agggctttcc attctgctca gacccccct	1200
ttactacccc cacaggccgg gtatctcctg taggtccac tgaccagtg acgccaacg	1260
tgagtgactc aagacctaag gtgtatgtat ccgagaacgc agtaaagaac actgtaactt	1320
atctcactcc caggacaacg gtaacctgtc gacgtcggac cctgactgac cctccgagac	1380
tggtaaatgg gtggtgtcca tccaacacaa gactcggagt ccaagtgtcc acttccggtg	1440
tcgtaggaac aggagtgcc caaacctcaa caacgacctc tacctcccga acccgctgag	1500
gcgcctttgt caataacaaa attgacatca ggacgacact ggtgaccgac tcaataaccg	1560
gaccgttcat atctcaggcg acaagaagag tcaataaac gaatatttat tgagaactca	1620
tacgacgact taaaaaggtg gttagtcggt cctcatgaca cgtccccca acctacgacg	1680
taccgttctt tccgagttca agtgcgggccc tgccatcatc cacatactac ctctatatca	1740
accagcaga cccggtatgt tttgtaattc ctattgtccc agcctcacta gttgcctatt	1800

10584378SEQ

aagtaagact	tacggtgtga	gtattccagg	atgtagtaac	gctcattgcc	tgtcctcaca	1860
gttacacgcc	aatagtaatc	tgttgacggt	cgcacccgat	tggccgtttg	aaaccaataa	1920
ctgggtggta	tttattcacc	ataaaactta	gagaccgagt	gttcaattac	gttgacgcag	1980
gagtaggagt	tgacccaatc	ttaacaatga	tcaatactta	ccaaaaccac	cgagtatgtg	2040
ccattagcag	cagtgccaac	acgccaaactc	aggccacagc	gataaacactc	gaaccgtgca	2100
catcctaggt	gataacaagt	gccattataa	cccttacttg	tcaaggaccc	acctgacaac	2160
ctttcacggt	aactgttttg	tcgacataac	ccgccctcct	aacgatcgcc	gtactgtcga	2220
gtctaagtct	aaaagggggac	tagatatcga	acacaaatct	cccgactaac	atcctcgtag	2280
cccaggcatt	tcgtgcaact	cttagtgact	tagtctggag	gaccgcgact	gacctaaaac	2340
ccaaagcgta	aacatcgaac	gacacagcaa	ggaccagtgc	aatttgctcc	agtcctcaaga	2400
taaaggcaac	gactcaacct	cagatccctt	gtgtccgtcc	ctgaccaaca	agtgggtggt	2460
ctctatacaa	cgcagaactc	aaagcccagag	cgtacatttt	cgctgccgta	gaaacagaag	2520
ctgtccgaat	gataataacc	tcgattatct	tccgaatccc	tcaaggccca	tatgggcctt	2580
gaccggtcaa	cgaagaagta	agtgttctag	actgaaatac	tgcacatccc	acatcttagg	2640
acacagtaag	acctactaca	agacctagtc	gtcccctacgt	aaccccatat	aatagagagc	2700
tggtgacata	cgcccgggac	cccatcgaac	aactcaagga	taatgtatag	gatattaaac	2760
tgccaacggt	aggtgagaaa	gtggaaacat	ggtcgacatc	ggtttttcta	cgaccccgtc	2820
taacacctgt	tcactttcgt	ggaggaaggg	gagacgctgt	aacttgccgc	acctaagtta	2880
tcactcgaac	cgtcaccacc	cgcccaaggt	cttccaatct	tcactccgac	actcgtcctc	2940
ggagacggtc	ccctacgtgg	tagacacccc	tccccggctc	cctctgaggt	aataaatata	3000
aggttttttt	tttttatttt	aaagttaaaa	acagctggac	gtcgagctgc	ctaggggggc	3060
ccaagaaata	agatatgaat	ttttcacttt	tatttatggt	tccaagaact	cccaacacaa	3120
tttaactttc	gctctttatt	agtatttaat	aaagtaatag	cgctataggc	aattcaaaca	3180
tagcattacc	tcctcggcgt	cagtctagga	tcgcagctcg	ggggagactc	agtcctttgt	3240
aaaagtctgg	atacctttga	tgaaggactt	ttgttgcaag	acagggggaa	cggcagggtt	3300
cgttacctac	taaactacga	caggggcctg	ctataacttg	ttaccaagtg	acttctgggt	3360
ccaggctctac	ttcgaggggtc	ttacgggtctc	cgacgagggg	ggcaccgggg	acgtgggtcgt	3420
cgaggatgtg	gccgccgggg	acgtgggtcgg	gggaggaccg	gggacagtag	aagacagggg	3480
agggctcttt	ggatggtccc	gtcgatgcca	aaggcagacc	cgaagaacgt	aagaccctgt	3540
cggttcagac	actgaacgtg	catgagggga	cgggagttgt	tctacaaaac	ggttgaccgg	3600
ttctggacgg	gacacgtcga	cacccaacta	aggtgtgggg	gcgggccgtg	ggcgcaggcg	3660

10584378SEQ

cggtaccggt agatgttcgt cagtgctcgt tactgcctcc aacactccgc gacgggggtg	3720
gtactcgcga cgagtctatc gctaccagac cggggaggag tcgtagaata ggctcacctt	3780
cctttaaacg cacacctcat aaacctactg tctttgtgaa aagctgtatc acaccaccac	3840
gggatactcg gcggaactcca accgagactg acatgggtgt aggtgatgtt gatgtacaca	3900
ttgtcaagga cgtaccgcc gtaactggcc tccgggtagg agtggtagta gtgtgacctt	3960
ctgaggtcac cattagatga ccctgccttg tcgaaactcc acgcacaaac acggacagga	4020
ccctctctgg ccgctgtgtt ccttctctta gaggcgttct tccccctcgg agtgggtgctc	4080
gacgggggtc cctcgtgatt cgctcgtgac ggggtgtgtt ggtcgaggag aggggtcgg	4140
ttcttctttg gtgacctacc tcttataaag tgggaagtct aggcacccgc actcgcgaag	4200
ctctacaagg ctctcgactt actccggaac cttgagttcc tacgggtccg acccttctc	4260
ggccccccct cgtcccgagt gaggtcgggt gacttcaggt ttttccagc cagatggagg	4320
gcggtatttt ttgagtacaa gttctgtctt cccggactga gtctgacttg cgcaaaaaat	4380
agggcccgag ctcccatggc ctaggaaaaa tatcgattaa tcagtgcatt gaaactctca	4440
tggtgaagtc gatggagaaa acacagagtc tcattgaaag aaattagtta aggttttgtc	4500
atatactaaa aggtaaagaa agtttctaca tcaaatgtag acgaggaaac aacttttcat	4560
cggactcgtg aagaaaagat ggtacttaat gtcgaccgtt ctagttaaaa aggtcaaga	4620
cctgtaaaat aaaaaaatt catcacacga tgtataaagt tataaaggtc taacatgtcg	4680
ctagtaattt cctcatgcag ggtacaatag gtcgttcagt catagtcgtg gaaacaagtt	4740
atcttcaaat tggtacaat ttaaaaataa actatgccga tatacatctc ctcaattggc	4800
taggcacaaa ctttatagat gtaggcggct tactcggtta tcttcaaatt ggtttaattg	4860
aaacaattcc attcgacggt ttgtgtttcc tcatttcgga ggcgacattt cttgtaacaa	4920
atgtatcaat aagaagttgt ctagaaagtg ataaaacatc agcagagagt tgtggcgtag	4980
tacgtctgtt cttcaacacg taagtcattg atgtccaaat cgaggatatg agtagttcta	5040
aaaatatcgg agccataaga acttgtaatg tcggtaaaagt tctcctctaa catctcatgg	5100
tataaggcac aatcccagct taggtaacag gtttttgat aaatctctac gtaacagtaa	5160
taggtactat cggagtgtct gcatatacat tcggtagaac ttacatatta aaacaacaaa	5220
agttgttggc gagcacttgt cgaagatatg aaaaagtaaa agaagtacta attatatcaa	5280
atgccttata ttcatatgtt tttcaaatat cattagagta ttatagactt tgtgtatgta	5340
ttttgtacct tcttaatgtg ctacagcaac tctatttacc gaaaaataac agtatcaaat	5400
gtttaagcgt cattagaagt agaaaatgct tataacgtct tagacaaaat aggttggtca	5460
ctaaaaacat atttatattga ccataggata gaaggctatc ttacgacaat aaattgtaaa	5520
aacgtggata attcaatgta gacagtttag gtagaaagggt tgactgaaat acattgctac	5580

10584378SEQ

gctttatcgt aaatagtgat acagcatggg ttaatagtac tgttctaaga gaatttatgc	5640
attagaataa tagagaacgt ataagcatta tcattaacat ttctcatatg ctattgtcat	5700
atctatatgt gcactatatt tataaattgg ggtaaggact ctttttatta atgctataat	5760
gtaaaggaaa ataataaaaa tacaaaatca ataaacaatc caatatgttt ttaatacaaa	5820
taaacacata taaatttcgc agcaattctt attcgaatca attgtataat agcgaatcca	5880
aaacatcata aacttaggaa agaaatttac ctaataaaaa ggttacgtat aaatatcgaa	5940
gtaggtttca tattgtaaat tgtaagtctt aacgccggcg ttaagttaag cattagtagc	6000
agtatcgaca aaggacacac ttttaacaata ggcgagtgtt aagggtgtgtt gtatgctcgg	6060
ccttcgtatt tcacatttcg gacccacgg attactcact cgattgagtg taattaacgc	6120
aacgcgagtg acgggcgaaa ggtcagccct ttggacagca cggtcgacgt aattacttag	6180
ccggttgccg gccctctcc gccaaacgca taaccgcga gaaggcgaag gagcgagtga	6240
ctgagcgacg cgagccagca agccgacgcc gtcgccata gtcgagttag tttccgccat	6300
tatgccata ggtgtcttag tcccctattg cgtcctttct tgtacactcg ttttccggtc	6360
gttttccggt ccttggcatt tttccggcg aacgaccgca aaaaggatc cgaggcgggg	6420
ggactgctcg tagtgttttt agctgcgagt tcagtctcca ccgctttggg ctgtcctgat	6480
atctctatgg tccgcaaagg gggaccttcg agggagcacg cgagaggaca aggctgggac	6540
ggcgaatggc ctatggacag gcggaagag ggaagccctt cgcaccgca aagagtatcg	6600
agtgcgacat ccatagagtc aagccacatc cagcaagcga ggttcgacct gacacacgtg	6660
cttggggggc aagtccggct ggcgacgcg aataggccat tgatagcaga actcaggttg	6720
ggccattctg tgctgaatag cggtgaccgt cgtcggtgac cattgtccta atcgtctcgc	6780
tccatacatc cgccacgatg tctcaagaac ttcaccaccg gattgatgcc gatgtgatct	6840
tcctgtcata aaccatagac gcgagacgac ttcggtcaat ggaagccttt ttctcaacca	6900
tcgagaacta ggccgtttgt ttggtggcga ccatcgccac caaaaaaaca aacgttcgtc	6960
gtctaatacg cgtctttttt tcctagagtt cttctaggaa actagaaaag atgccccaga	7020
ctgcgagtca ccttgctttt gaggtgcaatt ccctaaaacc agtactctaa tagtttttcc	7080
tagaagtgga tctaggaaaa ttttaattttt acttcaaaat ttagttagat ttcatatata	7140
ctcatttgaa ccagactgtc aatgggttac aattagtcac tccgtggata gagtcgctag	7200
acagataaag caagtaggta tcaacggact gaggggcagc acatctattg atgctatgcc	7260
ctcccgaatg gtagaccggg gtcacgacgt tactatggcg ctctgggtgc gaggggccga	7320
gggtctaaata gtcgttattt ggtcggtcgg cttccccggc tcgctcttc accaggacgt	7380
tgaatataggc ggaggtaggc cagataatta acaacggccc ttcgatctca ttcataagc	7440

10584378SEQ

gggtcaattat	caaacgcggt	gcaacaacgg	taacgatgtc	cgtagcacca	cagtgcgagc	7500
agcaaaccat	accgaagtaa	gtcgaggcca	agggttgcta	gttccgctca	atgtactagg	7560
gggtacaaca	cgttttttcg	ccaatcgagg	aagccaggag	gctagcaaca	gtcttcattc	7620
aaccggcgtc	acaatagtga	gtaccaatac	cgtcgtgacg	tattaagaga	atgacagtac	7680
ggtaggcatt	ctacgaaaag	acactgacca	ctcatgagtt	ggttcagtaa	gactcttata	7740
acatacgccg	ctggctcaac	gagaacgggc	cgagtttatg	ccctattatg	gcgcggtgta	7800
tcgtcttgaa	attttcacga	gtagtaacct	tttgcaagaa	gccccgcttt	tgagagttcc	7860
tagaatggcg	acaactctag	gtcaagctac	attgggtgag	cacgtggggt	gactagaagt	7920
cgtagaaaat	gaaagtggtc	gcaaagaccc	actcgttttt	gtccttccgt	tttacggcgt	7980
tttttccctt	attcccgcgtg	tgcctttaca	acttatgagt	atgagaagga	aaaagttata	8040
ataacttcgt	aaatagtccc	aataacagag	tactcgcccta	tgtataaact	tacataaatc	8100
tttttatattg	tttatcccca	aggcgcgtgt	aaaggggctt	ttcacgggtg	actgcagatt	8160
ctttggtaat	aatagtactg	taattggata	tttttatccg	catagtgctc		8210

<210> 4
 <211> 2100
 <212> DNA
 <213> Artificial

<220>
 <223> Homo sapiens

<400>	4	
atggagtctc	cctcggtccc	60
acagcctcac	ttctaacctt	120
acgccgttca	atgtcgagga	180
catctttttg	gctacagctg	240
ggatatgtaa	taggaactca	300
atatacccca	atgcatccct	360
accctacacg	tcataaagtc	420
taccggaac	tccctaagcc	480
gatgccgtcg	cttttacatg	540
aacaaccagt	ccctgcctgt	600
accctgttta	acgtgaccag	660
gtcagcgcca	ggaggtctga	720
acaatcagcc	ctctaaacac	780
gccgctagca	atcctcccg	840

10584378SEQ

accaggaac	tggtcattcc	caatattacc	gtgaacaata	gtggatccta	cacgtgccaa	900
gctcacaata	gcgacaccgg	actcaaccgc	acaaccgtga	cgacgattac	cggtgatgag	960
ccacaaaaac	cattcataac	tagtaacaat	tctaaccag	ttgaggatga	ggacgcagtt	1020
gcattaactt	gtgagccaga	gattcaaaat	accacttatt	tatggtgggt	caataaccaa	1080
agtttgccgg	ttagccacg	cttgacgttg	tctaatagata	accgcacatt	gacactcctg	1140
tccgttactc	gcaatgatgt	aggaccttat	gagtgtggca	ttcagaatga	attatccggt	1200
gatcactccg	accctgttat	ccttaatgtt	ttgtatggcc	cagacgaccc	aactatatct	1260
ccatcataca	cctactaccg	tcccggcggtg	aacttgagcc	tttcttgcca	tgcagcatcc	1320
aacccccctg	cacagtactc	ctggctgatt	gatggaaaca	ttcagcagca	tactcaagag	1380
ttattttataa	gcaacataac	tgagaagaac	agcggactct	atacttgcca	ggccaataac	1440
tcagccagtg	gtcacagcag	gactacagtt	aaaacaataa	ctgtttccgc	ggagctgccc	1500
aagccctcca	tctccagcaa	caactccaaa	cccgtggagg	acaaggatgc	tgtggccttc	1560
acctgtgaac	ctgaggctca	gaacacaacc	tacctgtggt	gggtaaatgg	tcagagcctc	1620
ccagtcagtc	ccaggctgca	gctgtccaat	ggcaacagga	ccctcactct	attcaatgtc	1680
acaagaaatg	acgcaagagc	ctatgtatgt	ggaatccaga	actcagttag	tgcaaaccgc	1740
agtgaccag	tcaccctgga	tgctctctat	gggccggaca	cccccatcat	ttcccccca	1800
gactcgtctt	acctttcggg	agcggacctc	aacctctct	gccactcggc	ctctaacca	1860
tccccgcagt	attcttggcg	tatcaatggg	ataccgcagc	aacacacaca	agttctcttt	1920
atcgccaaaa	tcacgccaaa	taataacggg	acctatgcct	gttttgtctc	taacttggtc	1980
actggccgca	ataattccat	agtcaagagc	atcacagtct	ctgcatctgg	aacttctcct	2040
ggtctctcag	ctggggccac	tgctggcatc	atgattggag	tgctgggttg	ggttgctctg	2100

<210> 5
 <211> 2100
 <212> DNA
 <213> Homo sapiens

<400> 5						
atggagtctc	cctcggcccc	tccccacaga	tggtgcatcc	cctggcagag	gctcctgctc	60
acagcctcac	ttctaaccct	ctggaaccgc	cccaccactg	ccaagctcac	tattgaatcc	120
acgccgttca	atgtcgcaga	ggggaaggag	gtgcttctac	ttgtccacaa	tctgccccag	180
catctttttg	gctacagctg	gtacaaaggt	gaaagagtgg	atggcaaccg	tcaaattata	240
ggatatgtaa	taggaactca	acaagctacc	ccagggcccc	catacagtgg	tcgagagata	300
atatacccca	atgcatccct	gctgatccag	aacatcatcc	agaatgacac	aggattctac	360
accctacacg	tcataaagtc	agatcttgtg	aatgaagaag	caactggcca	gttccgggta	420

10584378SEQ

taccgggagc tgcccaagcc ctccatctcc agcaacaact ccaaaccctg ggaggacaag	480
gatgctgtgg ccttcacctg tgaacctgag actcaggacg caacctacct gtggtgggta	540
aacaatcaga gcctcccggg cagtcccagg ctgcagctgt ccaatggcaa caggaccctc	600
actctattca atgtcacaag aaatgacaca gcaagctaca aatgtgaaac ccagaacca	660
gtgagtgccg ggcgagtgga ttcagtcacg ctgaatgtcc tctatggccc ggatgcccc	720
accatttccc ctctaaacac atcttacaga tcaggggaaa atctgaacct ctctgccac	780
gcagcctcta acccacctgc acagtactct tggtttgtca atgggacttt ccagcaatcc	840
acccaagagc tctttatccc caacatcact gtgaataata gtggatccta tacgtgccaa	900
gcccataact cagacactgg cctcaatagg accacagtca cgacgatcac agtctatgag	960
ccacccaaac ccttcacac cagcaacaac tccaaccccg tggaggatga ggatgctgta	1020
gccttaacct gtgaacctga gattcagaac acaacctacc tgtggtgggt aaataatcag	1080
agcctcccgg tcagtcacg gctgcagctg tccaatgaca acaggaccct cactctactc	1140
agtgtcaca ggaatgatgt aggaccctat gagtgtggaa tccagaacga attaatgtt	1200
gaccacagcg acccagtcac cctgaatgtc ctctatggcc cagacgacc caccatttcc	1260
ccctcataca cctattaccg tccaggggtg aacctcagcc tctcctgcc tgcagcctct	1320
aaccacctg cacagtattc ttggctgatt gatgggaaca tccagcaaca cacacaagag	1380
ctctttatct ccaacatcac tgagaagaac agcggactct atacctgcca ggccaataac	1440
tcagccagtg gccacagcag gactacagtc aagacaatca cagtctctgc ggagctgccc	1500
aagccctcca tctccagca caactccaaa cccgtggagg acaaggatgc tgtggccttc	1560
acctgtgaac ctgaggctca gaacacaacc tacctgtggt gggtaaattg tcagagcctc	1620
ccagtcagtc ccaggctgca gctgtccaat ggcaacagga ccctcactct attcaatgtc	1680
acaagaaatg acgcaagagc ctatgtatgt ggaatccaga actcagttag tgcaaaccgc	1740
agtgaccag tcaccctgga tgtcctctat gggccggaca ccccatcat tccccccca	1800
gactcgtctt acctttcggg agcggacctc aacctctcct gccactcggc ctctaacca	1860
tccccgcagt attcttggcg tatcaatggg ataccgcagc aacacacaca agttctcttt	1920
atcgccaaaa tcacgcaaaa taataacggg acctatgcct gttttgtctc taacttggt	1980
actggccgca ataattccat agtcaagagc atcacagtct ctgcatctgg aacttctcct	2040
ggtctctcag ctggggccac tgtcggcatc atgattggag tgctgggttg ggttgctctg	2100

<210> 6
 <211> 9
 <212> PRT
 <213> Homo sapiens

10584378SEQ

<400> 6

Leu Leu Thr Phe Trp Asn Pro Pro Thr
1 5

<210> 7

<211> 10

<212> PRT

<213> Homo sapiens

<400> 7

Val Leu Tyr Gly Pro Asp Ala Pro Thr Ile
1 5 10

<210> 8

<211> 9

<212> PRT

<213> Homo sapiens

<400> 8

Ile Met Ile Gly Val Leu Val Gly Val
1 5

<210> 9

<211> 9

<212> PRT

<213> Homo sapiens

<400> 9

Gln Ile Ile Gly Tyr Val Ile Gly Thr
1 5

<210> 10

<211> 9

<212> PRT

<213> Homo sapiens

<400> 10

Lys Thr Cys Pro Val Gln Leu Trp Val
1 5

<210> 11

<211> 9

<212> PRT

<213> Homo sapiens

<400> 11

Ser Thr Pro Pro Pro Gly Thr Arg Val
1 5

<210> 12

<211> 11

10584378SEQ

<212> PRT
 <213> Homo sapiens

<400> 12

Lys Thr Tyr Gln Gly Ser Tyr Gly Phe Arg Leu
 1 5 10

<210> 13
 <211> 10
 <212> PRT
 <213> Homo sapiens

<400> 13

Val Val Val Pro Tyr Glu Pro Pro Glu Val
 1 5 10

<210> 14
 <211> 314
 <212> PRT
 <213> Homo sapiens

<400> 14

Met Ala Pro Pro Gln Val Leu Ala Phe Gly Leu Leu Leu Ala Ala Ala
 1 5 10 15

Thr Ala Thr Phe Ala Ala Ala Gln Glu Glu Cys Val Cys Glu Asn Tyr
 20 25 30

Lys Leu Ala Val Asn Cys Phe Val Asn Asn Asn Arg Gln Cys Gln Cys
 35 40 45

Thr Ser Val Gly Ala Gln Asn Thr Val Ile Cys Ser Lys Leu Ala Ala
 50 55 60

Lys Cys Leu Val Met Lys Ala Glu Met Asn Gly Ser Lys Leu Gly Arg
 65 70 75 80

Arg Ala Lys Pro Glu Gly Ala Leu Gln Asn Asn Asp Gly Leu Tyr Asp
 85 90 95

Pro Asp Cys Asp Glu Ser Gly Leu Phe Lys Ala Lys Gln Cys Asn Gly
 100 105 110

Thr Ser Thr Cys Trp Cys Val Asn Thr Ala Gly Val Arg Arg Thr Asp
 115 120 125

Lys Asp Thr Glu Ile Thr Cys Ser Glu Arg Val Arg Thr Tyr Trp Ile
 130 135 140

10584378SEQ

Ile Ile Glu Leu Lys His Lys Ala Arg Glu Lys Pro Tyr Asp Ser Lys
145 150 155 160

Ser Leu Arg Thr Ala Leu Gln Lys Glu Ile Thr Thr Arg Tyr Gln Leu
165 170 175

Asp Pro Lys Phe Ile Thr Ser Ile Leu Tyr Glu Asn Asn Val Ile Thr
180 185 190

Ile Asp Leu Val Gln Asn Ser Ser Gln Lys Thr Gln Asn Asp Val Asp
195 200 205

Ile Ala Asp Val Ala Tyr Tyr Phe Glu Lys Asp Val Lys Gly Glu Ser
210 215 220

Leu Phe His Ser Lys Lys Met Asp Leu Thr Val Asn Gly Glu Gln Leu
225 230 235 240

Asp Leu Asp Pro Gly Gln Thr Leu Ile Tyr Tyr Val Asp Glu Lys Ala
245 250 255

Pro Glu Phe Ser Met Gln Gly Leu Lys Ala Gly Val Ile Ala Val Ile
260 265 270

Val Val Val Val Ile Ala Val Val Ala Gly Ile Val Val Leu Val Ile
275 280 285

Ser Arg Lys Lys Arg Met Ala Lys Tyr Glu Lys Ala Glu Ile Lys Glu
290 295 300

Met Gly Glu Met His Arg Glu Leu Asn Ala
305 310

<210> 15
<211> 314
<212> PRT
<213> Artificial

<220>
<223> Homo sapiens

<400> 15

Met Ala Pro Pro Gln Val Leu Ala Phe Gly Leu Leu Leu Ala Ala Ala
1 5 10 15

Thr Ala Thr Phe Ala Ala Ala Gln Glu Glu Cys Val Cys Glu Asn Tyr
20 25 30

Lys Leu Ala Val Asn Cys Phe Val Asn Asn Asn Arg Gln Cys Gln Cys
Page 15

10584378SEQ

35 40 45
 Thr Ser Val Gly Ala Gln Asn Thr Val Ile Cys Ser Lys Leu Ala Ala
 50 55 60
 Lys Cys Leu Val Met Lys Ala Glu Met Asn Gly Ser Lys Leu Gly Arg
 65 70 75 80
 Arg Ala Lys Pro Glu Gly Ala Leu Gln Asn Asn Asp Gly Leu Tyr Asp
 85 90 95
 Pro Asp Cys Asp Glu Ser Gly Leu Phe Lys Ala Lys Gln Cys Asn Gly
 100 105 110
 Thr Ser Thr Cys Trp Cys Val Asn Thr Ala Gly Val Arg Arg Thr Asp
 115 120 125
 Lys Asp Thr Glu Ile Thr Cys Ser Glu Arg Val Arg Thr Tyr Trp Ile
 130 135 140
 Ile Ile Glu Leu Lys His Lys Ala Arg Glu Lys Pro Tyr Asp Ser Lys
 145 150 155 160
 Ser Leu Arg Thr Ala Leu Gln Lys Glu Ile Thr Thr Arg Tyr Gln Leu
 165 170 175
 Asp Pro Lys Phe Ile Thr Ser Val Leu Tyr Glu Asn Asn Val Ile Thr
 180 185 190
 Ile Asp Leu Val Gln Asn Ser Ser Gln Lys Thr Gln Asn Asp Val Asp
 195 200 205
 Ile Ala Asp Val Ala Tyr Tyr Phe Glu Lys Asp Val Lys Gly Glu Ser
 210 215 220
 Leu Phe His Ser Lys Lys Met Asp Leu Thr Val Asn Gly Glu Gln Leu
 225 230 235 240
 Asp Leu Asp Pro Gly Gln Thr Leu Ile Tyr Tyr Val Asp Glu Lys Ala
 245 250 255
 Pro Glu Phe Ser Met Gln Gly Leu Lys Ala Gly Val Ile Ala Val Ile
 260 265 270
 Val Val Val Val Ile Ala Val Val Ala Gly Ile Val Val Leu Val Ile
 275 280 285

10584378SEQ

Ser Arg Lys Lys Arg Met Ala Lys Tyr Glu Lys Ala Glu Ile Lys Glu
 290 295 300

Met Gly Glu Met His Arg Glu Leu Asn Ala
 305 310

<210> 16
 <211> 10
 <212> PRT
 <213> Homo sapiens

<400> 16

Gln Leu Asp Pro Lys Phe Ile Thr Ser Ile
 1 5 10

<210> 17
 <211> 10
 <212> PRT
 <213> Artificial

<220>
 <223> Homo sapiens

<400> 17

Gln Leu Asp Pro Lys Phe Ile Thr Ser Val
 1 5 10

<210> 18
 <211> 36
 <212> DNA
 <213> Homo sapiens

<400> 18
 caaaatttat cacgagtgtg ttgtatgaga ataatg

36

<210> 19
 <211> 36
 <212> DNA
 <213> Artificial

<220>
 <223> Homo sapiens

<400> 19
 cattattctc atacaacaca ctctgtgataa attttg

36

<210> 20
 <211> 945
 <212> DNA
 <213> Artificial

<220>
 <223> Homo sapiens

<400> 20

10584378SEQ

atggcgcccc	cgcaggtcct	cgcggttcggg	cttctgcttg	ccgcggcgac	ggcgactttt	60
gccgcagctc	aggaagaatg	tgtctgtgaa	aactacaagc	tggccgtaaa	ctgctttgtg	120
aataataatc	gtcaatgcc	gtgtacttca	gttggtgcac	aaaatactgt	catttgctca	180
aagctggctg	ccaaatgttt	ggtgatgaag	gcagaaatga	atggctcaaa	acttgggaga	240
agagcaaaac	ctgaaggggc	cctccagaac	aatgatgggc	tttatgatcc	tgactgcgat	300
gagagcgggc	tctttaaggc	caagcagtgc	aacggcacct	ccacgtgctg	gtgtgtgaac	360
actgctgggg	tcagaagaac	agacaaggac	actgaaataa	cctgctctga	gcgagtgaga	420
acctactgga	tcattcattga	actaaaacac	aaagcaagag	aaaaacctta	tgatagtaaa	480
agtttgcgga	ctgcacttca	gaaggagatc	acaacgcgtt	atcaactgga	tccaaaattt	540
atcacgagtg	tggtgtatga	gaataatggt	atcactattg	atctggttca	aaattcttct	600
caaaaaactc	agaatgatgt	ggacatagct	gatgtggctt	attattttga	aaaagatggt	660
aaaggtgaat	ccttgtttca	ttctaagaaa	atggacctga	cagtaaattg	ggaacaactg	720
gatctggatc	ctggtcaaac	tttaatttat	tatgttgatg	aaaaagcacc	tgaattctca	780
atgcagggtc	taaaagctgg	tgttattgct	gttattgtgg	ttgtggtgat	agcagttggt	840
gctggaattg	ttgtgctggt	tatttccaga	aagaagagaa	tggcaaagta	tgagaaggct	900
gagataaagg	agatgggtga	gatgcatagg	gaactcaatg	cataa		945

<210> 21
 <211> 9515
 <212> DNA
 <213> Artificial

<220>
 <223> ALVAC

<400> 21	
atggcgcccc	cgcaggtcct
cgcggttcggg	cttctgcttg
ccgcggcgac	ggcgactttt
60	
gccgcagctc	aggaagaatg
tgtctgtgaa	aactacaagc
tggccgtaaa	ctgctttgtg
120	
aataataatc	gtcaatgcc
gtgtacttca	gttggtgcac
aaaatactgt	catttgctca
180	
aagctggctg	ccaaatgttt
ggtgatgaag	gcagaaatga
atggctcaaa	acttgggaga
240	
agagcaaaac	ctgaaggggc
cctccagaac	aatgatgggc
tttatgatcc	tgactgcgat
300	
gagagcgggc	tctttaaggc
caagcagtgc	aacggcacct
ccacgtgctg	gtgtgtgaac
360	
actgctgggg	tcagaagaac
agacaaggac	actgaaataa
cctgctctga	gcgagtgaga
420	
acctactgga	tcattcattga
actaaaacac	aaagcaagag
aaaaacctta	tgatagtaaa
480	
agtttgcgga	ctgcacttca
gaaggagatc	acaacgcgtt
atcaactgga	tccaaaattt
540	
atcacgagtg	tggtgtatga
gaataatggt	atcactattg
atctggttca	aaattcttct
600	
caaaaaactc	agaatgatgt
ggacatagct	gatgtggctt
attattttga	aaaagatggt
660	

10584378SEQ

aaaggtgaat	ccttgtttca	ttctaagaaa	atggacctga	cagtaaattg	ggaacaactg	720
gatctggatc	ctggtcaaac	tttaatttat	tatgttgatg	aaaaagcacc	tgaattctca	780
atgcagggtc	taaaagctgg	tgttattgct	gttattgtgg	ttgtggtgat	agcagttggt	840
gctggaattg	ttgtgctggt	tattttccaga	aagaagagaa	tggcaaagta	tgagaaggct	900
gagataaagg	agatgggtga	gatgcatagg	gaactcaatg	cataagaagc	ttatcgatac	960
cgtcgacctc	gaggaattct	ttttattgat	taactagtta	atcacggccg	cttataaaga	1020
tctaaaatgc	ataattttcta	aataatgaaa	aaaaagtaca	tcatgagcaa	cgcgtagta	1080
tattttacaa	tggagattaa	cgctctatac	cgttctatgt	ttattgattc	agatgatggt	1140
ttagaaaaga	aagtatttga	atatgaaaac	tttaatgaag	atgaagatga	cgacgatgat	1200
tattgtttga	aatctgtttt	agatgaagaa	gatgacgcgc	taaagtatac	tatggttaca	1260
aagtataagt	ctatactact	aatggcgact	tgtgcaagaa	ggtatagtat	agtgaaaatg	1320
ttgtagatt	atgattatga	aaaaccaa	aatcagatc	cataatctaaa	ggatatctct	1380
ttgcacataa	tttcatctat	tcctagttta	gaatacctgc	agccaagctt	ggcactggcc	1440
gtcgtttttac	aacgtcgtga	ctgggaaaac	cctggcggtta	cccaacttaa	tcgccttgca	1500
gcacatcccc	ctttcgccag	ctggcgtaat	agcgaagagg	cccgcaccga	tcgcccttcc	1560
caacagttgc	gcagcctgaa	tggcgaatgg	cgctgatgc	ggtattttct	ccttacgcat	1620
ctgtgcggta	ttcacaccg	catatggtgc	actctcagta	caatctgctc	tgatgccgca	1680
tagttaagcc	agccccgaca	cccgccaa	cccgtgacg	cgccctgacg	ggcttgtctg	1740
ctcccgcat	ccgcttacag	acaagctgtg	accgtctccg	ggagctgcat	gtgtcagagg	1800
ttttcacctg	catcaccgaa	acgcgcgaga	cgaaagggcc	tcgtgatacg	cctattttta	1860
taggttaatg	tcatgataat	aatggtttct	tagacgtcag	gtggcacttt	tcggggaaat	1920
gtgcgcggaa	cccctatttg	tttatttttc	taaatacatt	caaatatgta	tccgctcatg	1980
agacaataac	cctgataaat	gcttcaataa	tattgaaaaa	ggaagagtat	gagtattcaa	2040
cattttccgtg	tcgcccttat	tccctttttt	gcggcatttt	gccttcctgt	ttttgctcac	2100
ccagaaacgc	tggtgaaagt	aaaagatgct	gaagatcagt	tgggtgcacg	agtgggtmac	2160
atcgaactgg	atctcaacag	cggttaagatc	cttgagagtt	ttcgccccga	agaacgtttt	2220
ccaatgatga	gcacttttaa	agttctgcta	tgtggcgcg	tattatcccc	tattgacgcc	2280
gggcaagagc	aactcggtcg	ccgcatacac	tattctcaga	atgacttggt	tgagtactca	2340
ccagtcacag	aaaagcatct	tacggatggc	atgacagtaa	gagaattatg	cagtgtgcc	2400
ataaccatga	gtgataaac	tgcgccaac	ttacttctga	caacgatcgg	aggaccgaag	2460
gagctaaccg	cttttttgca	caacatgggg	gatcatgtaa	ctcgccttga	tcgttgggaa	2520

10584378SEQ

ccggagctga atgaagccat accaaacgac gagcgtgaca ccacgatgcc thtagcaatg	2580
gcaacaacgt tgcgcaaact attaaactggc gaactactta ctctagcttc ccggcaacaa	2640
ttaatagact ggatggaggc ggataaagtt gcaggaccac ttctgcgctc ggcccttccg	2700
gctggctggt ttattgctga taaatctgga gccggtgagc gtgggtctcg cggtatcatt	2760
gcagcactgg ggccagatgg taagccctcc cgtatcgtag ttatctacac gacggggag	2820
caggcaacta tggatgaacg aaatagacag atcgtgaga taggtgcctc actgattaag	2880
cattggtaac tgcagacca agtttactca tatatacttt agattgattt aaaacttcat	2940
ttttaattta aaaggatcta ggtgaagatc ctttttgata atctcatgac caaaatccct	3000
taacgtgagt tttcgttcca ctgagcgtca gaccccgtag aaaagatcaa aggatcttct	3060
tgagatcctt tttttctgcg cgtaatctgc tgcttgcaaa caaaaaaacc accgctacca	3120
gcggtggttt gtttgccgga tcaagagcta ccaactcttt ttccgaagg	3180
agcagagcgc agataccaaa tactgtcctt ctagtgtagc cgtagttagg ccaccacttc	3240
aagaactctg tagcaccgcc tacatacctc gctctgctaa tcctgttacc agtggctgct	3300
gccagtggcg ataagtcgtg tcttaccggg ttggactcaa gacgatagtt accggataag	3360
gcgcagcggc cgggctgaac ggggggttcg tgcacacagc ccagcttga gcgaacgacc	3420
tacaccgaac tgagatacct acagcgtgag ctatgagaaa gcgccacgct tcccgaagg	3480
agaaaggcgg acaggatatcc ggtaagcggc agggctcgga caggagagcg cacgaggag	3540
cttccagggg gaaacgcctg gtatctttat agtcctgtcg ggtttcgcca cctctgactt	3600
gagcgtcgat ttttgtgatg ctcgctcagg gggcggagcc tatggaaaaa cgccagcaac	3660
gcggcctttt tacggttcct ggccttttgc tggccttttg ctacatgtt ctttcctgcg	3720
ttatccctg attctgtgga taaccgtatt accgcctttg agtgagctga taccgctcgc	3780
cgcagccgaa cgaccgagcg cagcgagtca gtgagcgagg aagcggaaga gcgcccaata	3840
cgcaaaccgc ctctccccgc gcgttggccg attcattaat gcagctggca cgacaggttt	3900
cccgactgga aagcgggcag tgagcgcaac gcaattaatg tgagttagct cactcattag	3960
gcacccagc ctttacactt tatgcttccg gctcgtatgt tgtgtggaat tgtgagcgga	4020
taacaatttc acacaggaaa cagctatgac catgattacg aattgaattg cggccgcaat	4080
tctgaatgtt aaatgttata ctttggatga agctataaat atgcattgga aaaataatcc	4140
atttaaagaa aggattcaaa tactacaaaa cctaagcgat aatatgttaa ctaagcttat	4200
tcttaacgac gctttaaata tacacaaata aacataattt ttgtataacc taacaaataa	4260
ctaaaacata aaaataataa aaggaaatgt aatatcgtaa ttattttact cagggaatggg	4320
gttaaataatt tatatcacgt gtatatctat actgttatcg tatactcttt acaattacta	4380
ttacgaatat gcaagagata ataagattac gtatttaaga gaatcttgtc atgataattg	4440

10584378SEQ

ggtacgacat agtgataaat gctatttcgc atcgttacat aaagtcagtt ggaaagatgg	4500
at ttgacaga tgtaacttaa taggtgcaaa aatgttaa ataacagcattc tatcggaaga	4560
taggatacca gttatattat acaaaaatca ctggttgat aaaacagatt ctgcaatatt	4620
cgtaaaagat gaagattact gcgaatttgt aaactatgac aataaaaagc catttatctc	4680
aacgacatcg tgtaattctt ccatgtttta tgtatgtgtt tcagatatta tgagattact	4740
ataaactttt tgtatactta tattccgtaa actatattaa tcatgaagaa aatgaaaaag	4800
tatagaagct gttcacgagc gggtgttgaa aacaacaaaa ttatacattc aagatggcct	4860
acataacgt ctgtgaggct atcatggata atgacaatgc atctctaaat aggtttttgg	4920
acaatggatt cgaccctaac acggaatatg gtactctaca atctcctctt gaaatggctg	4980
taatgttcaa gaataccgag gctataaaaa tcttgatgag gtatggagct aaacctgtag	5040
ttactgaatg cacaacttct tgtctgcatg atgcggtgtt gagagacgac taaaaatag	5100
tgaaagatct gttgaagaat aactatgtaa acaatgttct ttacagcgga ggctttactc	5160
ctttgtgttt ggcagcttac cttaacaaag ttaatttgggt taaacttcta ttggctcatt	5220
cggcggatgt agatatttca aacacggatc gggttaactcc tctacatata gccgtatcaa	5280
ataaaaattt aacaatgggt aaacttctat tgaacaaagg tgctgatact gacttgctgg	5340
ataacatggg atgtactcct ttaatgatcg ctgtacaatc tggaaatatt gaaatatgta	5400
gcacactact taaaaaaaat aaaatgtcca gaactgggaa aaattgatct tgccagctgt	5460
aattcatggt agaaaagaag tgctcaggct acttttcaac aaaggagcag atgtaaacta	5520
catctttgaa agaaatggaa aatcatatac tgttttggaa ttgattaaag aaagttactc	5580
tgagacacaa aagaggtagc tgaagtggta ctctcaaagg tacgtgacta attagctata	5640
aaaaggatcc tagaggatca ttatttaacg taaactaaat ggaaaagcta ttacaggta	5700
catacgggtgt tttctggaat caaatgattc tgattttgag gattttatca atacaataat	5760
gacagtgcta actggtaaaa aagaaagcaa acaattatca tggctaacaa tttttattat	5820
at ttgtagta tgcatagtgg tctttacgtt tctttattta aagttaatgt gttaagatta	5880
aatggagtaa ttggatcccc catcgatggg gaattcactg gccgtcgttt tacaacgtcg	5940
tgactgggaa aaccctggcg ttaccaact taatgcctt gcagcacatc cccctttcgc	6000
cagctggcgt aatagcgaag aggccgcac cgatcgccct tcccaacagt tgcgcagcct	6060
gaatggcgaa tggcgctttg cctggtttcc ggcaccagaa gcggtgccgg aaagctggct	6120
ggagtgcgat cttcctgagg ccgatactgt cgtcgtcccc tcaaactggc agatgcacgg	6180
ttacgatgcg cccatctaca ccaacgtaac ctatcccatt acggtcaatc cgccgtttgt	6240
tcccacggag aatccgacgg gttgttactc gctcacattt aatgttgatg aaagctggct	6300

10584378SEQ

acaggaaggc cagacgcgaa ttatTTTTga tggcgTTaac tcggcgTTtc atctgtgggtg	6360
caacggggcgc tgggtcggtt acggccagga cagtcgtttg ccgtctgaat ttgacctgag	6420
cgcattTTtta cgcgccggag aaaaccgcct cgcggtgatg gtgctgcgtt ggagtgcg	6480
cagttatctg gaagatcagg atatgtggcg gatgagcggc atTTTccgtg acgtctcg	6540
gctgcataaa ccgactacac aaatcagcga TTTccatggt gccactcgct ttaatgatga	6600
TTTcagccgc gctgtactgg aggctgaagt tcagatgtgc ggcgagttgc gtgactacct	6660
acgggtaaca gTTTctttat ggcagggTga aacgcaggTc gccagcggca ccgcgcTTT	6720
cggcggtgaa attatcgatg agcgtggtgg ttatgccgat cgcgtcacac tacgtctgaa	6780
cgtcgaaaac ccgaaactgt ggagcgccga aatcccgaat ctctatcgtg cggTggtTga	6840
actgcacacc gccgacggca cgctgattga agcagaagcc tgcgatgtcg gTTTccgcga	6900
ggTgcggatt gaaaatggTc Tgctgctgct gaacggcaag ccgtTgctga tTcgaggcgt	6960
taaccgtcac gagcatcatc ctctgcatgg tcaggTcatg gatgagcaga cgatggTgca	7020
ggatatcctg ctgatgaagc agaacaactt taacgccgtg cgctgtTcg attatccgaa	7080
ccatccgtg tggtacacgc Tgtgcgaccg ctacggcctg tatgtggTgg atgaagccaa	7140
tattgaaacc cacggcatgg tgccaatgaa tcgtctgacc gatgatccgc gctggctacc	7200
ggcgatgagc gaacgcgTaa cgcgaaTggt gcagcgcgat cgtaatcacc cgagtgtgat	7260
catctggTcg ctggggaaTg aatcaggcca cggcgctaTt cacgacgcgc Tgtatcgctg	7320
gatcaaTct gtcgatcctt cccgcccggT gcagTatgaa ggcggcggag ccgacaccac	7380
ggccaccgat attattTgcc cgatgtacgc gcgcgtggat gaagaccagc cTTcccggc	7440
Tgtgccgaaa Tggtccatca aaaaatggct tTcgTacct ggagagacgc gcccgtgat	7500
cTTTtgcgaa tacgcccag cgatgggTaa cagTctTggc ggtTtcgcta aatactggca	7560
ggcgTTTcgt cagtatcccc gTTTcacagg cggctTcgTc Tgggactggg TggatcagTc	7620
gctgattaaa tatgatgaaa acggcaacc gtggtcggtt tacggcggTg atTTTggcga	7680
tacgccgaac gatcgccagt tctgtatgaa cggTctggtc TTTgccgacc gcacgccga	7740
Tccagcgctg acggaagcaa aacaccagca gcagTTTTc cagTtccgtt tatccgggca	7800
aaccatcgaa gtgaccagcg aatacctgtt ccgtcatagc gataacgagc Tcctgcactg	7860
gatggTggcg ctggatggTa agccgctggc aagcggTgaa gtgcctctgg atgtcgctcc	7920
acaaggtaaa cagTtgattg aactgcctga actaccgag ccggagagcg ccgggcaact	7980
ctggctcaca gtacgcgtag tgcaaccgaa cgcgaccga TggTcagaag ccgggcacat	8040
cagcgctTg cagcagTggc gtctggcgga aaacctcagt gtgacgtcc ccgccgctc	8100
ccacgccatc ccgcatctga ccaccagcga aatggattTt Tgcatcgagc Tgggtaataa	8160
gcgtTggcaa TTTaaccgcc agtcaggctt TctTtcacag atgtggattg gcgataaaaa	8220

10584378SEQ

acaactgctg	acgccgctgc	gcgatcagtt	cacccgtgca	ccgctggata	acgacattgg	8280
cgtaagtga	gcgacccgca	ttgaccctaa	cgcctgggtc	gaacgctgga	aggcggcggg	8340
ccattaccag	gccgaagcag	cggtgttgca	gtgcacggca	gatacacttg	ctgatgcggt	8400
gctgattacg	accgctcacg	cgtggcagca	tcaggggaaa	accttattta	tcagccggaa	8460
aacctaccgg	attgatggta	gtggtcaa	ggcgattacc	gttgatgttg	aagtggcgag	8520
cgataaccg	catccggcgc	ggattggcct	gaactgccag	ctggcgcagg	tagcagagcg	8580
ggtaaacctg	ctcggattag	ggccgcaaga	aaactatccc	gaccgcctta	ctgccgcctg	8640
ttttgaccgc	tgggatctgc	cattgtcaga	catgtatacc	ccgtacgtct	tcccgaagcg	8700
aaacggtctg	cgctgcggga	cgcgcaatt	gaattatggc	ccacaccagt	ggcgcgcgga	8760
cttcagttc	aacatcagcc	gctacagtca	acagcaactg	atggaaacca	gccatcgcca	8820
tctgctgcac	gcggaagaag	gcacatggct	gaatatcgac	ggtttccata	tggggattgg	8880
tggcgacgac	tcctggagcc	cgtcagtatc	ggcggaattc	cagctgagcg	ccggtcgcta	8940
ccattaccag	ttggtctggt	gtcaaaaata	ataataaccg	ggcagggggg	atccggagct	9000
tatcgcagat	caatgatcgc	tgtacaatct	ggaaatattg	aaatatgtag	cacactactt	9060
aaaaaaaata	aaatgtccag	aactgggaaa	aattgatctt	gccagctgta	attcatggta	9120
gaaaagaagt	gctcaggcta	cttttcaaca	aaggagcaga	tgtaaactac	atctttgaaa	9180
gaaatgaaa	atcatatact	gttttggaat	tgattaaaga	aagttactct	gagacacaaa	9240
agaggtagct	gaagtggtag	tctcaaaggt	acgtgactaa	ttagctataa	aaaggatccg	9300
gtaccctcga	gtctagaatc	gatccccggg	taattaatta	gttatttagac	aagggtgaaaa	9360
cgaaactatt	tgtagcttaa	ttaattagag	cttctttatt	ctatacttaa	aaagtgaaaa	9420
taaatacaaa	ggttcttgag	ggttgtgtta	aattgaaagc	gagaaataat	cataaattat	9480
ttcattatcg	cgatatccgt	taagtttgta	tcgta			9515

<210> 22
 <211> 9515
 <212> DNA
 <213> Artificial

<220>
 <223> ALVAC

<400>	22	
taccgcgggg	gcgtccagga	gcgcaagccc gaagacgaac ggcgccgctg ccgctgaaaa 60
cggcgctcag	tccttcttac	acagacactt ttgatgttcg accggcattt gacgaaacac 120
ttattattag	cagttacggt	cacatgaagt caaccacgtg ttttatgaca gtaaaccgagt 180
ttcgaccgac	ggtttacaaa	ccactacttc cgtctttact taccgagttt tgaaccctct 240

10584378SEQ

tctcgttttg gacttccccg ggaggtcttg ttactaccg aaataactagg actgacgcta	300
ctctcgcccc agaaattccg gttcgtcacg ttgccgtgga ggtgcacgac cacacacttg	360
tgacgacccc agtcttcttg tctgttcctg tgactttatt ggacgagact cgctcactct	420
tggatgacct agtagtaact tgattttgtg tttcgttctc tttttggaat actatcattt	480
tcaaacgcct gacgtgaagt cttcctctag tgttcgcaa tagttgacct aggtttttaa	540
tagtgctcac acaacatact cttattacaa tagtgataac tagaccaagt tttagaaga	600
gttttttgag tcttactaca cctgtatcga ctacaccgaa taataaaact ttttctacaa	660
tttccactta ggaacaaagt aagattcttt tacctggact gtcatttacc cttgttgac	720
ctagacctag gaccagtttg aaattaaata atacaactac tttttcgtgg acttaagagt	780
tacgtcccag attttcgacc acaataacga caataacacc aacaccacta tcgtcaacaa	840
cgaccttaac aacacgacca ataaaggctt ttcttctctt accgtttcat actcttccga	900
ctctatttcc tctaccact ctacgtatcc cttgagttac gtattcttcg aatagctatg	960
gcagctggag ctcttaaga aaaataacta attgatcaat tagtgccggc gaatatttct	1020
agattttacg tattaaagat ttattacttt tttttcatgt agtactcgtt gcgcaatcat	1080
ataaaatgtt acctctaatt gcgagatatg gcaagataca aataactaag tctactacaa	1140
aatcttttct ttcaataact tatacttttg aaattacttc tacttctact gctgctacta	1200
ataacaacat ttagacaaaa tctacttctt ctactgcgcg atttcatatg ataccaatgt	1260
ttcatattca gatatgatga ttaccgctga acacgttctt ccatatcata tcacttttac	1320
aacaatctaa tactaatact ttttggttta tttagtctag gtatagattt ccatagagga	1380
aacgtgtatt aaagtagata aggatcaaat cttatggacg tcggttcgaa ccgtgaccgg	1440
cagcaaatg ttgcagcact gacccttttg ggaccgcaat gggttgaatt agcggaacgt	1500
cgtgtagggg gaaagcggtc gaccgcatta tcgcttctcc gggcgtggct agcgggaagg	1560
gttgtcaacg cgtcggactt accgcttacc gcggactacg ccataaaaga ggaatgcgta	1620
gacacgccat aaagtgtggc gtataccacg tgagagtcac gttagacgag actacggcgt	1680
atcaattcgg tcggggctgt gggcggttgt gggcgactgc gcgggactgc ccgaacagac	1740
gagggccgta ggcgaatgtc tgttcgacac tggcagaggc cctcgacgta cacagtctcc	1800
aaaagtggca gtagtggtt tgcgcgctct gctttcccgg agcactatgc ggataaaaat	1860
atccaattac agtactatta ttaccaaga atctgcagtc caccgtgaaa agcccctta	1920
cacgcgcctt ggggataaac aaataaaaag atttatgtaa gtttatacat aggcgagtac	1980
tctgttattg ggactattta cgaagttatt ataactttt ctttctcata ctcataagtt	2040
gtaaaggcac agcgggaata agggaaaaaa cgccgtaaaa cggaaggaca aaaacgagtg	2100
ggtctttgcg accactttca ttttctacga cttctagtca acccacgtgc tcaccaatg	2160

10584378SEQ

tagcttgacc	tagagttgtc	gccattctag	gaactctcaa	aagcggggct	tcttgcaaaa	2220
ggttactact	cgtgaaaatt	tcaagacgat	acaccgcgcc	ataatagggc	ataactgcgg	2280
cccgttctcg	ttgagccagc	ggcgtatgtg	ataagagtct	tactgaacca	actcatgagt	2340
ggtcagtgtc	tttctgtaga	atgcctaccg	tactgtcatt	ctcttaatac	gtcacgacgg	2400
tattggtact	cactattgtg	acgccggttg	aatgaagact	gttgctagcc	tcctggcttc	2460
ctcgattggc	gaaaaaacgt	gttgtagccc	ctagtacatt	gagcggaact	agcaaccctt	2520
ggcctcgact	tacttcggta	tggtttgctg	ctcgcaactg	ggtagctacg	acatcgttac	2580
cgttggttga	acgcgtttga	taattgaccg	cttgatgaat	gagatcgaag	ggccgttggt	2640
aattatctga	cctacctccg	cctatttcaa	cgtcctgggtg	aagacgcgag	ccgggaaggc	2700
cgaccgacca	aataacgact	atttagacct	cggccactcg	caccagagc	gccatagtaa	2760
cgtcgtgacc	ccggtctacc	attcgggagg	gcatagcatc	aatagatgtg	ctgccccctca	2820
gtccgttgat	acctacttgc	tttatctgtc	tagcgactct	atccacggag	tgactaattc	2880
gtaaccattg	acagtctggt	tcaaatgagt	atatatgaaa	tctaactaaa	ttttgaagta	2940
aaaattaaat	tttcttagat	ccacttctag	gaaaaactat	tagagtactg	gttttaggga	3000
attgcactca	aaagcaaggt	gactcgcagt	ctggggcatc	ttttctagtt	tcctagaaga	3060
actctaggaa	aaaaagacgc	gcattagacg	acgaacgttt	gttttttttg	tggcgatggt	3120
cgccaccaa	caaacggcct	agttctcgat	ggttgagaaa	aaggcttcca	tgaccgaag	3180
tcgtctcgcg	tctatggttt	atgacaggaa	gatcacatcg	gcatcaatcc	ggtggtgaag	3240
ttcttgagac	atcgtggcgg	atgtatggag	cgagacgatt	aggacaatgg	tcaccgacga	3300
cggtcaccgc	tattcagcac	agaatggccc	aacctgagtt	ctgctatcaa	tggcctattc	3360
cgcgtcgcca	gcccgaactg	cccccaagc	acgtgtgtcg	ggtcgaacct	cgcttgctgg	3420
atgtggcttg	actctatgga	tgctgcactc	gatactcttt	cgcggtgcga	agggcttccc	3480
tctttccgcc	tgtccatagg	ccattcgccg	tcccagcctt	gtcctctcgc	gtgctccctc	3540
gaaggtcccc	ctttgcggac	catagaaata	tcaggacagc	ccaaagcggg	ggagactgaa	3600
ctcgcagcta	aaaacactac	gagcagtcct	cccgcctcgg	ataccttttt	gcggtcgttg	3660
cgcgggaaaa	atgccaaagg	ccggaaaacg	accggaaaac	gagtgtacaa	gaaaggacgc	3720
aataggggac	taagacacct	attggcataa	tggcggaaac	tcactcgact	atggcgagcg	3780
gcgtcggttt	gctggctcgc	gtcgtcagtc	cactcgtctc	ttcgcttctt	cgcggttat	3840
gcgtttggcg	gagagggggc	cgcaaccggc	taagtaatta	cgtcgaccgt	gctgtccaaa	3900
gggctgacct	ttcgcccgtc	actcgcgttg	cgtaatttac	actcaatcga	gtgagtaatc	3960
cgtgggggtcc	gaaatgtgaa	atacgaaggc	cgagcataca	acacacctta	acactcgcct	4020

10584378SEQ

attgttaaag	tgtgtccttt	gtcgatactg	gtactaatgc	ttaacttaac	gccggcgtta	4080	
agacttaca	tttacaatat	gaaacctact	tcgatattta	tacgtaacct	ttttattagg	4140	
taaatttctt	tcctaagttt	atgatgtttt	ggattcgcta	ttatacaatt	gattcgaata	4200	
agaattgctg	cgaaatttat	atgtgtttat	ttgtattaaa	aacatattgg	attgtttatt	4260	
gattttgtat	ttttattatt	ttcctttaca	ttatagcatt	aataaaatga	gtccttacct	4320	
caatttataa	atatagtgc	catatagata	tgacaatagc	atatgagaaa	tgттаатgat	4380	
aatgcttata	cgttctctat	tattctaattg	cataaattct	cttagaacag	tactattaac	4440	
ccatgctgta	tcactattta	cgataaagcg	tagcaatgta	tttcagtc	caacctttctacc	4500	
taaactgtct	acattgaatt	atccacgttt	ttacaattta	ttgtcgtaag	atagccttct	4560	
atcctatggt	caatataata	tgttttttagt	gaccaacct	ttttgtctaa	gacgttataa	4620	
gcattttcta	cttctaata	ga	cgcttaaaca	tttgatactg	ttatttttcg	gtaaataagag	4680
ttgctgtagc	acattaagaa	ggtacaaaat	acatacacia	agtctataat	actctaata	ga	4740
tatttgaaaa	acatatgaat	ataaggcatt	tgatataatt	agtacttctt	ttactttttc		4800
atatcttcga	caagtgtctg	ccaacaactt	ttgttgtttt	aatatgtaag	ttctaccgaa		4860
tgtatatgca	gacactccga	tagtacctat	tactgtttacg	tagagattta	tccaaaaacc		4920
tgttacctaa	gctgggattg	tgctttatac	catgagatgt	tagaggagaa	ctttaccgac		4980
attacaagtt	cttatggctc	cgatattttt	agaactactc	catacctcga	tttggacatc		5040
aatgacttac	gtgttgaaga	acagacgtac	tacgccacaa	ctctctgctg	atgtttttatc		5100
acttttctaga	caacttctta	ttgatacatt	tgttacaaga	aatgtcgcct	ccgaaatgag		5160
gaaacacaaa	ccgtcgaatg	gaattgtttc	aattaaacca	atttgaagat	aaccgagtaa		5220
gccgcctaca	tctataaagt	ttgtgcctag	ccaattgagg	agatgtatat	cggcatagtt		5280
tattttttaa	ttgtttacaa	tttgaagata	acttgtttcc	acgactatga	ctgaacgacc		5340
tattgtaccc	tacatgagga	aattactagc	gacatgttag	acctttataa	ctttatacat		5400
cgtgtgatga	atTTTTTTT	ttttacaggt	cttgaccctt	tttaactaga	acggtcgaca		5460
ttaagtacca	tcttttcttc	acgagtccga	tgaaaagttg	tttcctcgtc	tacatttgat		5520
gtagaaactt	tcttttacct	ttagtatatg	acaaaacctt	aactaatttc	tttcaatgag		5580
actctgtggt	ttctccatcg	acttcaccat	gagagtttcc	atgcactgat	taatcgatat		5640
ttttcctagg	atctcctagt	aataaattgc	atttgattta	ccttttcgat	aaatgtccat		5700
gtatgccaca	aaagacctta	gtttactaag	actaaaactc	ctaaaatagt	tatgtttatta		5760
ctgtcacgat	tgaccatttt	ttctttcggt	tgттаатagt	accgattggt	aaaaataata		5820
taaacatcat	acgtatcacc	agaaatgcaa	agaaataaat	ttcaattaca	caatttcta		5880
ttacctcatt	aacctagggg	gtagctaccc	cttaagtgc	cggcagcaaa	atgttgcagc		5940

10584378SEQ

actgaccctt ttgggaccgc aatgggttga attagcggaa cgtcgtgtag ggggaaagcg	6000
gtcgaccgca ttatcgcttc tccgggctgt gctagcggga agggttgtca acgcgtcgga	6060
cttaccgctt accgcgaaac ggaccaaagg cctgtggtctt cgccacggcc ttctgaccga	6120
cctcacgcta gaaggactcc ggctatgaca gcagcagggg agtttgaccg tctacgtgcc	6180
aatgctacgc gggtagatgt ggttgcatgt gatagggtaa tgccagttag gcggcaaaca	6240
agggtgcttc ttaggctgcc caacaatgag cgagtgtaaa ttacaactac ttctgaccga	6300
tgtccttccg gtctgcgctt aataaaaact accgcaattg agccgcaaag tagacaccac	6360
gttgcccgcg acccagccaa tgccggctct gtcagcaaac ggcagactta aactggactc	6420
gcgtaaaaat gcgcggcctc ttttggcgga gcgccactac cacgacgcaa cctcactgcc	6480
gtcaatagac cttctagtcc tatacaccgc ctactcgccg taaaaggcac tgcagagcaa	6540
cgacgtatct ggctgatgtg tttagtcgct aaaggtacaa cggtgagcga aattactact	6600
aaagtcggcg cgacatgacc tccgacttca agtctacacg ccgctcaacg cactgatgga	6660
tgcccattgt caaagaaata ccgtcccact ttgctgccag cggtcgccgt ggcgcgga	6720
gccgccactt taatagctac tcgcaccacc aatacggcta gcgcagtgtg atgcagactt	6780
gcagcttttg ggctttgaca cctcgcggtt ttagggctta gagatagcac gccaccaact	6840
tgacgtgtgg cggctgccgt gcgactaact tcgtcttcgg acgctacagc caaaggcgct	6900
ccacgcctaa cttttaccag acgacgacga cttgccgttc ggcaacgact aagctccgca	6960
attggcagtg ctcgtagtag gagacgtacc agtccagtac ctactcgtct gctaccacgt	7020
cctataggac gactacttcg tcttggtgaa attgcggcac gcgacaagcg taataggctt	7080
ggtaggcgac accatgtgcg acacgctggc gatgccggac atacaccacc tacttcggtt	7140
ataacttttg gtgccgtacc acggttactt agcagactgg ctactaggcg cgaccgatgg	7200
ccgtactctg cttgcgcatt gcgcttacca cgtcgcgcta gcattagtgg gctcacacta	7260
gtagaccagc gaccccttac ttagtccggt gccgcgatta gtgctgcgcg acatagcgac	7320
ctagttttaga cagctaggaa gggcgggcca cgtcatactt ccgccgcctc ggctgtggtg	7380
ccggtggcta taataaacgg gctacatgcg cgcgcaccta cttctggtcg ggaagggccg	7440
acacggcttt accaggtagt tttttaccga aagcgatgga cctctctgcg cgggcgacta	7500
ggaaacgctt atgcgggtgc gctaccatt gtcagaaccg ccaaagcgat ttatgaccgt	7560
ccgcaaagca gtcatagggg caaatgtccc gccgaagcag accctgaccc acctagtcag	7620
cgactaattt atactacttt tgccgttggg caccagccga atgccgccac taaaaccgct	7680
atgcggcttg ctagcggcca agacatactt gccagaccag aaacggctgg cgtgcggcgt	7740
aggtcgcgac tgccttcgtt ttgtggctgt cgtcaaaaag gtcaaggcaa ataggcccgt	7800

10584378SEQ

ttggtagctt cactggtcgc ttatggacaa ggcagtatcg ctattgctcg aggacgtgac	7860
ctaccaccgc gacctaccat tcggcgaccg ttcgccactt cacggagacc tacagcgagg	7920
tgttccattt gtcaactaac ttgacggact tgatggcgtc ggcctctcgc ggcccgttga	7980
gaccgagtgt catgcgcatac acgttggctt gcgctggcgt accagtcttc ggcccgtgta	8040
gtcgcggacc gtcgtcaccg cagaccgcct tttggagtca cactgcgagg ggcggcgag	8100
ggtgcggtag ggcgtagact ggtggtcgct ttacctaataa acgtagctcg acccattatt	8160
cgcaaccgtt aaattggcgg tcagtccgaa agaaagtgtc tacacctaac cgctattttt	8220
tgttgacgac tgcggcgacg cgctagtcaa gtgggcacgt ggcgacctat tgctgtaacc	8280
gcattcactt cgctgggcgt aactgggatt gcggaccag cttgcgacct tccgccgccc	8340
ggtaatggtc cggcttcgtc gcaacaacgt cacgtgccgt ctatgtgaac gactacgcca	8400
cgactaatgc tggcgagtgc gcaccgtcgt agtccccctt tggaataaat agtcggcctt	8460
ttggatggcc taactaccat caccagttta ccgctaattg caactacaac ttcaccgctc	8520
gctatgtggc gtaggccgcg cctaaccgga cttgacggtc gaccgcgtcc atcgtctcgc	8580
ccatttgacc gagcctaatac ccggcgcttct tttgataggg ctggcggaat gacggcggac	8640
aaaactggcg accctagacg gtaacagtct gtacatatgg ggcattgcaga agggctcgct	8700
tttgccagac gcgacgccct gcgcgcttaa cttaataccg ggtgtggtca ccgcgccgct	8760
gaaggctcaag ttgtagtcgg cgatgtcagt tgtcgttgac tacctttggt cggtagcgg	8820
agacgacgtg cgccttcttc cgtgtaccga cttatagctg ccaaaggat acccctaacc	8880
accgctgctg aggacctcgg gcagtcatac ccgccttaag gtcgactcgc ggccagcgat	8940
ggtaatggtc aaccagacca cagtttttat tattattggc ccgtcccccc taggcctcga	9000
atagcgtcta gttactagcg acatgttaga cttttataac tttatacatc gtgtgatgaa	9060
ttttttttat ttacaggtc ttgacccttt ttaactagaa cggtcgacat taagtaccat	9120
cttttcttca cgagtccgat gaaaagttgt ttcctcgtct acatttgatg tagaaacttt	9180
ctttaccttt tagtatatga caaaacctta actaatttct ttcaatgaga ctctgtgttt	9240
tctccatcga cttcaccatg agagtttcca tgcactgatt aatcgatatt tttcctaggc	9300
catgggagct cagatcttag ctagggccca attaatatt caataatctg ttccactttt	9360
gctttgataa acatcgaatt aattaatctc gaagaaataa gatatgaatt tttcactttt	9420
atztatgttt ccaagaactc ccaacacaat ttaactttcg ctctttatta gtatttaata	9480
aagtaatagc gctataggca attcaaacat agcat	9515